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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/668,234

09/24/2003

Toshiharu Seko

1035-469

2043

23117 7590 02/11/2008
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EXAMINER

ANDUJAR, LEONARDO

ART UNIT

PAPER NUMBER

2826

MAIL DATE

DELIVERY MODE

02/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/668,234	SEKO, TOSHIHARU	
	Examiner	Art Unit	
	Leonardo Andújar	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 8-14 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7,15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/31/2007 has been entered.

Election/Restrictions

2. Applicant's election without traverse of group I (claims 1-7) in the reply filed on 03/18/2005 is acknowledged

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

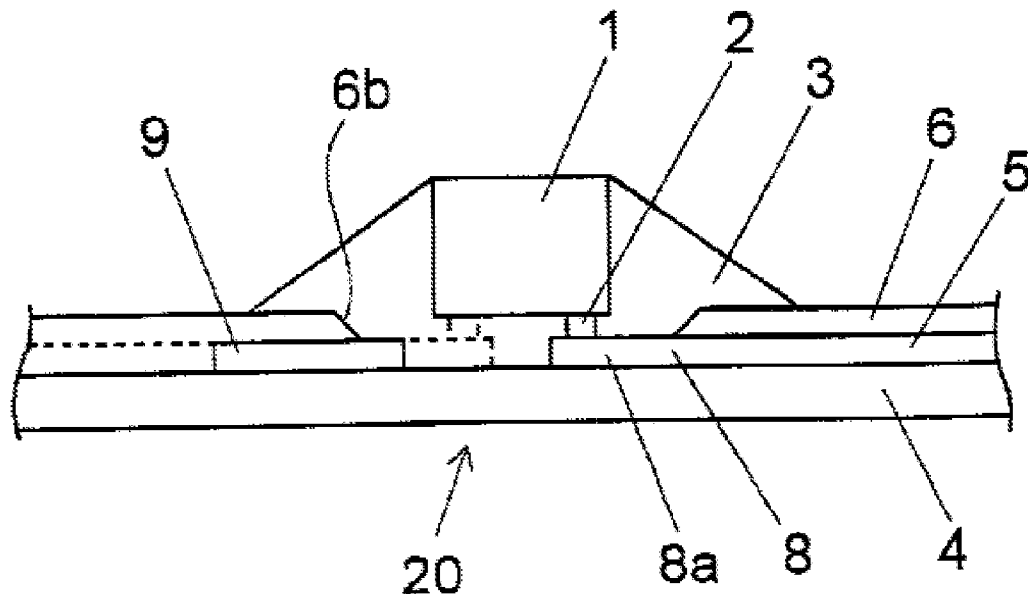
4. Initially, and with respect to claims 1, 7, 15 and 16, note that a "product by process" claim is directed to the product per se, no matter how actually made. See In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) and the related case law cited therein which makes it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product,

whether claimed in "product by process" claims or not. As stated in Thorpe, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); In re Pilkington, 411 F.2d 1345, 1348, 162 USPQ 145, 147 (CCPA 1969); Buono v. Yankee Maid Dress Corp., 77 F.2d 274, 279, 26 USPQ 57, 61 (2d. Cir. 1935). Note that Applicant has burden of proof in such cases as the above case law makes clear.

5. Claims 1, 2, 4-7, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seko (US 2002/0043713) in view of Papathomas et al. (US 5,656,862).

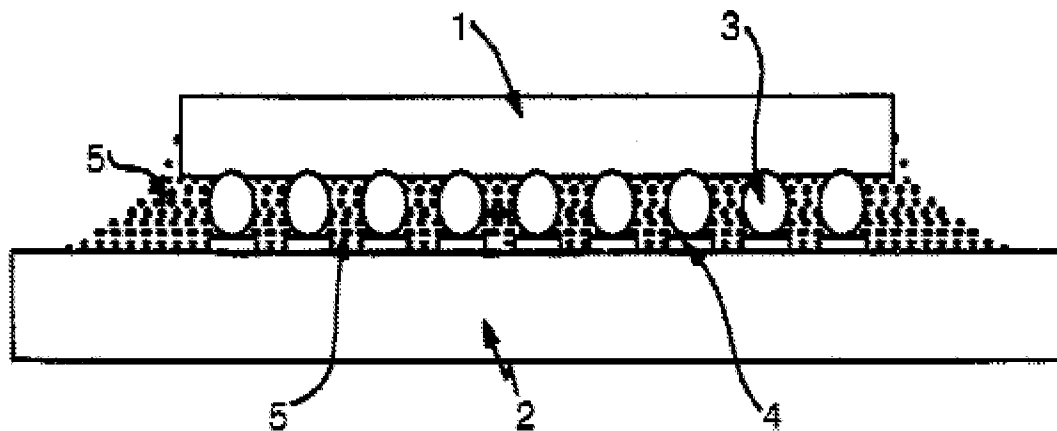
6. Regarding claims 1, 7, 15 and 16, Seko (e.g. fig. 3) shows a semiconductor device comprising: an insulating substrate 4 having an interconnection pattern 5; a solder resist 6; a semiconductor element 1, having a projecting electrode 2, electrically connected to the interconnection pattern via the projecting electrode; a resin 3 for anchoring the semiconductor element and located between the semiconductor element and the substrate, wherein said solder resist is provided over part of the interconnection pattern but leaves the interconnection pattern exposed in an area that is to be connected to the semiconductor element via the projecting electrode, and wherein the insulating resin covers at least edge portions of the solder resist, and wherein the solder resist is laterally offset and spaced laterally outwardly from an outer edge of the semiconductor element when viewed from above; and wherein the insulating substrate is a polyimide based insulating tape that is freely bendable and that has a thickness

within a range of 15 to 40 micrometers (pp 049). Also, the resin seals the projections electrodes in electrical contact with the interconnection pattern.



Seko does not disclose that the resin is a fillet resin having at least a resin anti-repellent such as a surfactant, that the substrate is a tape that is bendable or that the resin fillet extends no more than about half way up a sidewall of the semiconductor element. Therefore, Sako does not teach that this anti repellent improves/adjusts the wettability of the insulating resin for the interconnection pattern and the insulating substrate. Nevertheless, Papathomas (e.g. fig. 1) disclosed a semiconductor device comprising a resin fillet 5 for anchoring a semiconductor element 1 on a substrate 2 that is a bendable tape (e.g. polyimide substrate; claim 22) wherein the resin fillet seals the projecting electrodes in electrical contact with the interconnection pattern. The resin fillet is an insulating resin containing a resin anti-repellent such as a surfactant (col. 4/lls. 1-18 & col. 14/lls. 31-42). Also, the fillet extend no more than about half way up a side

wall of the semiconductor element. Although Papathomas does not explicitly teach that this anti repellent improves and/or adjusts the wettability of the insulating resin for the interconnection pattern and the insulating substrate this limitation is an inherent property of the material (i.e. Triton X-100). Furthermore, this type of resin fillet enhances the fatigue life of the solder interconnections between the semiconductor device and the supporting substrate (col. 3/lis. 3-41).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the resin disclosed by Sako in accordance with Papathomas's invention including a resin fillet having a anti-repellent such as a surfactant (e.g., Triton X-100) wherein the resin fillet does not extend more than a halfway of a sidewall of the semiconductor element in order to enhance the fatigue life of the solder interconnections between the semiconductor device. With regards to the method of making the resin fillet such as wherein the resin is configured so that pressing of the semiconductor element against the interconnect pattern thought the resin after the resin has been provided on the substrate forms the resin fillet.

7. Regarding claim 2, Papathomas teaches that the anti repellent is a surfactant such as Triton X-100. Papathomas does not explicitly teach that this anti repellent improves the wettability of the insulating resin for the interconnection pattern and the insulating substrate. Nevertheless, this limitation is an inherent property of the material.

8. Regarding claim 4, Papathomas teaches that the resin anti-repellent is a surfactant (e.g. Triton X-100; col. 14/lis. 31-42).

9. Regarding claim 5, Papathomas teaches that insulating resin is a light curable resin or a thermosetting resin (e.g. epoxy resin col. 4/lis. 1-18 & col. 9/lis. 31-40)

10. Regarding claim 6, Papathomas teaches that the insulating resin contains conductive particles dispersed in the insulating resin (col. 9/lis. 31-40).

Response to Arguments

11. Applicant's arguments filed on 10/31/2007 have been considered but are not persuasive. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In regards to applicant's argument that the prior art does not teach that the semiconductor element is pressed against the interconnection pattern through the resin after the resin has been provided on the substrate so as to form the resin fillet, it is respectfully noted that a "product by process" claim is directed to the product per se, no matter how actually made. See *In re Thorpe et al.*, 227 USPQ 964 (CAFC, 1985). In

this case, the method of making the device is an intermediate process step that does not affect the structure of the final device.

12. Regarding applicant's argument that the prior art does not teach a resin fillet extending no more than about half-way up a sidewall of the semiconductor element. It is respectfully noted that Papathomas teaches this limitation as shown in figure 1. As the best understanding of the Examiner the figure is clear with regards to the argued limitation. In light of the objective evidence, one having ordinary skills in the art would not fairly interpret the teachings of Papathomas' as suggested by Applicant because nothing in the drawings or in the written disclosure of Papathomas suggested that the resin fillet extends more than about half-way up a sidewall of the semiconductor element nor a reason or motivation to do so.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on 571-272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 2826

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leonardo Andújar/
Primary Examiner, Art Unit 2826

02/03/2008